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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,825	05/15/2001	Amita Chandra	WEICKM10	9533

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EXAMINER	
OLSEN, KAJ K	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/831,825	CHANDRA ET AL.	
	Examiner	Art Unit	
	Kaj K. Olsen	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,17-19,21 and 23-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,17-19,21 and 23-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 28 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 28 is drawn to a catalyst made by a particular process. Unless applicant construes a porous silver halide as being a catalyst (the specification gives no indication that one would consider silver halide to be a catalyst), it doesn't appear that applicant ever disclosed how to make a catalyst by the set forth process. Applicant has not provided any examples of a catalyst made by the set forth methods nor has the applicant given us any guidance (either generally or specifically) as to what kind of catalysts could be made by the disclosed method. What catalysts comprise porous inorganic ionic components with their pores filled with electrolyte? The only discussion the examiner can find in the specification about catalysis is p. 1, ll. 13-15 where the applicant noted that porous materials find utility for catalysis. The remainder of the specification concerns the forming of an electrolyte for an electrochemical cell. Hence, the applicant is enabled for claims 1-27, but one possessing ordinary skill in the art would not have been enabled for constructing a catalyst based on the disclosure. Applicant is not enabled for a catalyst because merely recognizing that porous

materials find utility in the catalytic art absent either general or specific guidance for how to form such a catalytic material does not constitute enablement for claim 28.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-9, 17-19, 21, 23, 25-28 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takata (USP 3,928,162). Takata is being cited and relied on for the first time with this office action.

5. With respect to claims 1 and 26, Takata discloses an electrochemical cell that contains as an electrolyte a mesh containing AgI, AgCl, AgBr, or Hg_2Cl_2. See col. 4, ll. 40-50. A mesh containing these components would read on a "mechanically stable porous solid comprising one or more inorganic ionic components". Takata further discloses filing the pores with liquid electrolyte. See col. 3, ll. 65-68 and col. 7, l. 43 through col. 8, l. 27. With respect to the limitations drawn to how the material was obtained in claims 1 and 26, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Takata the process from which it was made is the same as or obvious over the process utilized by Takata (see *In re Thorpe*, 777 F.2d 695, 698).

6. With respect to claims 2-9 and 17, these claims also only concern the process for which the electrolyte was made (see above).

7. With respect to claims 18 and 19, Takata is a gas sensor.

8. With respect to claims 21 and 27, Takata teaches the use of AgCl, which is the same ion-conducting material of the instant invention.

9. With respect to claims 23 and 25, although Takata does not explicitly disclose the pore sizes or the degree of porosity, one possessing ordinary skill in the art would recognize that finding the appropriate balance between porosity and sensor performance would require only routine skill in the art.

10. With respect to claim 28, this claim is identical to claim 26 except for the substitution of "catalyst" for "electrolyte". If the applicant construes the electrolyte of claim 26 as also being a catalyst (see 112 rejection above), then the electrolyte of Takata is inherently a catalyst. Even if the applicant does not consider the electrolyte of claim 26 to be a catalyst, then the "catalyst" of claim 26 is just the intended use of the material and the intended use need not be given further due consideration in determining patentability. Absent explicitly claimed catalytic structure or materials that read free of the structure of Takata, this claim does not read free of Takata.

11. Claims 1-9, 17-19, 21, 23 and 25-28 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sawyer et al (Electrochemistry for Chemists, 2nd Edition, 1995, pp. 184-196). Sawyer is being cited and relied on for the first time with this office action.

12. With respect to claims 1 and 26, Sawyer discloses an electrochemical cell or electrolyte that comprises AgCl in a "gauze" or "spongy" form. See p. 190, the first two full paragraphs. This gauzy or spongy AgCl would read on "mechanically stable porous solid comprising one or more inorganic ionic components" giving the claim language its broadest reasonable

interpretation. Sawyer further discloses adding liquid electrolyte to this porous AgCl. See p. 190, the third full paragraph. This liquid electrolyte would presumably permeate the pores of the gauzy or spongy AgCl to thereby form the electrochemical contact. With respect to the limitations drawn to how the material was obtained in claims 1 and 26, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Sawyer the process from which it was made is the same as or obvious over the process utilized by Sawyer (see *In re Thorpe*, 777 F.2d 695, 698).

13. With respect to claims 2-9 and 17, these claims also only concern the process for which the electrolyte was made (see above).

14. With respect to claims 18 and 19, utilizing these reference electrodes for a sensor or gas sensor constitutes that is only the intended use of the electrolyte or electrochemical cell. Applicant hasn't actually claimed any explicit elements of the gas sensor so it doesn't read free of Sawyer.

15. With respect to claims 21 and 27, Sawyer teaches the use of AgCl, which is the same ion-conducting material of the instant invention.

16. With respect to claims 23 and 25, although Sawyer does not explicitly disclose the pore sizes or the degree of porosity, Sawyer recognizes that the degree of porosity must balance speed with bias potentials. See p. 190, the second full paragraph. One possessing ordinary skill in the art would have been motivated to utilize the broadly defined pore sizes and porosity to arrive at the desired balance between speed and potential bias.

17. With respect to claim 28, this claim is identical to claim 26 except for the substitution of "catalyst" for "electrolyte". If the applicant construes the electrolyte of claim 26 as also being a

catalyst (see 112 rejection above), then the electrolyte of Sawyer is inherently a catalyst. Even if the applicant does not consider the electrolyte of claim 26 to be a catalyst, then the "catalyst" of claim 26 is just the intended use of the material and the intended use need not be given further due consideration in determining patentability. Absent explicitly claimed catalytic structure or materials that read free of the structure of Sawyer, this claim does not read free of Sawyer.

Claim Rejections - 35 USC § 103

18. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

19. Claims 1-9, 17-19, 21, 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leonard et al (USP 3,681,136) in view of any of Oehme et al (Liquid Electrolyte Sensors from Sensors-A comprehensive survey, part I, 1991), Takata or Sawyer.

20. As discussed in previous office actions, Leonard discloses the presence of an electrolyte that comprises a porous solid comprising one or more inorganic ionic components (i.e. AgCl). See previous office actions and col. 4, l. 62 through col. 6, l. 28 and fig. 1. Leonard does not appear to disclose the step of filling the pores of the porous solid with a liquid. However, it standard practice to fill a reference electrode with liquid electrolyte. This was demonstrated by Oehme, which teaches that reference electrodes must be placed in electrical communication with the sample of interest. This is most typically done by exposing the Ag/AgCl of the reference electrode to a liquid electrolyte so as to established the electrical connection. See section 7.1.2.3 on pages 251-253, especially fig. 7.6 and Table 7-5. This was also demonstrated by Takata, which taught that a porous layer of AgCl must also include electrolyte. See col. 3, ll. 65-68 and

col. 7, l. 43 through col. 8, l. 27. This was also demonstrated by Sawyer, which taught the addition of liquid electrolyte at some later time after the sensor construction. See p. 190, the third full paragraph. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teachings of any of Oehme, Takata or Sawyer and fill the pores of Leonard with liquid electrolyte in order to ensure the reference electrode is in electrical communication with the sample and the other electrodes. With respect to the limitations drawn to how the material was obtained in claims 1 and 26, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Sawyer the process from which it was made is the same as or obvious over the process utilized by Sawyer (see *In re Thorpe*, 777 F.2d 695, 698). However, Leonard already anticipated or rendered obvious the various method limitations (see the previous office actions).

21. With respect to claims 2-9 and 17, these claims also only concern the process for which the electrolyte was made (see above). However, Leonard would appear to disclose or render obvious these process limitations as well. See the previous office actions.

22. With respect to claims 18 and 19, utilizing this reference electrode for a sensor or gas sensor constitutes that is only the intended use of the electrolyte or electrochemical cell. Applicant hasn't actually claimed any explicit elements of the gas sensor so it doesn't read free of Leonard.

23. With respect to claims 21 and 27, Leonard teaches the use of AgCl, which is the same ion-conducting material of the instant invention.

24. With respect to claims 23 and 25, see col. 2, lines 30-57 of Leonard. Alternatively, finding the desired porosity of a porous solid to arrive at the desired sensor properties requires only routine skill in the art.

25. With respect to claim 24, see fig. 2 and 3. In addition, because the method of Leonard is so similar to the method disclosed by the instant invention, Leonard inherently would result in a lamellar pore structure.

26. With respect to claim 28, this claim is identical to claim 26 except for the substitution of "catalyst" for "electrolyte". If the applicant construes the electrolyte of claim 26 as also being a catalyst (see 112 rejection above), then the electrolyte of Sawyer is inherently a catalyst. Even if the applicant does not consider the electrolyte of claim 26 to be a catalyst, then the "catalyst" of claim 26 is just the intended use of the material and the intended use need not be given further due consideration in determining patentability. Absent explicitly claimed catalytic structure or materials that read free of the structure of Leonard in view of any of Oehme, Takata or Sawyer, this claim does not read free of Leonard in view of any of Oehme, Takata or Sawyer.

27. Claim 24 (and claims 1-9, 17-19, 21, 23 and 25-28 in the alternative) is/are rejected under 35 U.S.C. 103(a) as being unpatentable over either Takata or Sawyer in view of Leonard.

28. With respect to claim 24, Takata and Sawyer set forth all the limitations of the claim, but did not explicitly disclose the presence of lamellar pore structure. However, Leonard discloses an alternate means for generating a porous AgCl structure for a reference electrode electrolyte. See rejection above with Leonard as a primary reference. The pore structure arrived at by Leonard would appear to be lamellar in view of fig. 2 and 3. Alternatively, because the method of Leonard for creating the porous AgCl is substantially the same or an obvious variant of the

method utilized by the instant invention (see previous office actions for the rejection of the applicant's claimed method), the pores arrived at by the means of Leonard would have inherently been lamellar. Leonard's method for forming porous AgCl results in a reference electrode that reaches equilibrium quickly and is inexpensive to fabricate. See col. 1, ll. 28-45. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Leonard to construct the porous reference electrolyte of either Takata or Sawyer to arrive at a reference electrode that reaches equilibrium quickly and is inexpensive to manufacture.

29. With respect to 1-9, 17-19, 21, 23 and 25-28 in the alternative, even if the various process limitations of these claims were construed as defining a structure different from that of either Takata or Sawyer, then it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Leonard to construct the porous reference electrolyte of either Takata or Sawyer to arrive at a reference electrode that reaches equilibrium quickly and is inexpensive to manufacture.

Response to Arguments

30. Applicant's arguments filed 1-21-2005 have been fully considered but they are not persuasive.

31. With respect to the rejection relying on Leonard, applicant urges that the porous layer of Leonard is not mechanically stable. First, it is entirely unclear how "mechanically stable" breathes patentable distinction over the teaching of Leonard. Where has the applicant defined "mechanically stable" that it would read away from the electrolyte layer of Leonard? On p. 9 of

the arguments, applicant equates "mechanically stable" with requiring no supporting structure. First, this definition was never set forth in the originally filed disclosure and it cannot be relied on to establish any distinction between the instant invention and Leonard. In addition, "mechanically stable" has scope well beyond what the applicant equated it to mean. Leonard creates an electrolyte layer that results in a reference electrode that performs well under testing. See table I in col. 6. Leonard would clearly meet "mechanically stable" giving the claim language its broadest reasonable interpretation. Applicant urges that Leonard requires a very thin layer. However, applicant has never claimed a thickness that reads away from the thickness of Leonard. Furthermore, the specification does not appear to disclose any thicknesses, nor any criticality of the thicknesses, that would read away from the thicknesses of Leonard. In addition, it is unclear why the applicant deems the electrolyte layer of Leonard to lack mechanical stability when the method that Leonard utilizes to form said layer is so remarkably similar to that of the instant invention (see the previous rejections of the method claims). The only distinction the examiner recognized between the applicant's method and the method disclosed by Leonard during the prosecution of the method claims was the applicant was explicitly setting forth adding liquid electrolyte back to the porous structure (this issue will be discussed in detail below). However, that would appear to have no bearing on whether the porous structure would be mechanically stable or not.

32. Applicant also urges that the combined teachings of Leonard and Oehme as set forth in the previous office action (and maintained in the modified rejection in this office action) would not have resulted in an electrolyte "as a whole". It is unclear what the applicant is getting at with this point. The "electrolyte" of the instant invention comprises (as an example) a porous AgCl

layer with a solution of KCl embedded in its pores. This is precisely the structure the examiner is alluding would result from the combined teachings of Leonard and Oehme. The fact that the applicant calls this an "electrolyte" or a "solid electrolyte" and Leonard just considers this to be part of their reference electrode is not pertinent. The AgCl layer of Leonard would appear to be functioning as an electrolyte because the AgCl is an electrochemical bridge between the metal of the reference electrode and the other electrodes of the electrochemical cell. See section 7.1.2.3 of Oehme. Moreover, even if there were some functional distinction between the applicant's "electrolyte" and the AgCl layer of Leonard and Oehme, that functional distinction would just be the intended use of the layer. The amended claims are drawn to structure and the intended use of a structure is not to be giving further due consideration in determining patentability.

33. Applicant also urges that Leonard fails to disclose an electrochemical cell, a sensor for the determination of gases or a catalyst. However, in each of these claims, the only structural element explicitly set forth is the porous solid with liquid electrolyte in its pores. Absent any other specified structure in these claims, applicant's "electrochemical cell", "sensor" or "catalyst" is just intended use of the porous solid with electrolyte in its pores. Moreover, the examiner draws the applicant's attention to new teaching Takata, which shows that porous ionic solid layers find utility as gas sensors.

34. The examiner has withdrawn the rejection relying on Shen because the porous solids of Shen would not appear to be porous inorganic ionic components filled with liquid electrolyte.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 5:30 A.M. to 3:00 P.M. and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753
April 14, 2005

KAJ K. OLSEN
PRIMARY EXAMINER